

PATENT COOPERATION TREATY

PCT

REC'D 08 DEC 2004



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference. P005113-PCT		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/BR 03/00127	International filing date (day/month/year) 05.09.2003	Priority date (day/month/year) 12.09.2002
International Patent Classification (IPC) or both national classification and IPC B60B3/14		
Applicant [MERITOR DO BRASIL LTDA. et al.] <i>Arvinmeritor Do Brasil sistemas Automotivos Ltda</i>		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 6 sheets.

- This report contains indications relating to the following items:
  - ☒ Basis of the opinion
  - ☐ Priority
  - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Lack of unity of invention
  - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Certain documents cited
  - ☐ Certain defects in the international application
  - ☐ Certain observations on the international application

Date of submission of the demand  15.03.2004	Date of completion of this report  07.12.2004
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Bolte, U  Telephone No. +49 89 2399-7431  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/BR 03/00127

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

3-7 as originally filed  
1, 2, 2a received on 19.08.2004 with letter of 18.08.2004

**Claims, Numbers**

1-4 received on 19.08.2004 with letter of 18.08.2004

**Drawings, Sheets**

1/4, 2/4 as originally filed  
3/4, 4/4 received on 19.08.2004 with letter of 18.08.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/BR 03/00127**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2), with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-4
	No: Claims	
Inventive step (IS)	Yes: Claims	1-4
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-4
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/BR 03/00127

**Re Item V**

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**State of the art:**

Document (D1) EP 0 768 191 A cited in the application and in the search report forms the most relevant state of the art. It discloses a vehicle wheel formed by associating a rim and a disc according to the preamble of claim 1.

**Distinguishing features:**

Claim 1 of the present application is distinguished from the state of the art in that the first contact surface of the disc cooperates with the rim at the end of the flange.

**Objective task:**

There was to design an esthetically attractive and at the same time low cost wheel.

**Grounds for the statement:**

The subject-matter of the present application is considered as new (Art. 33(2) PCT) (see above) and implies an inventive step (Art. 33(3) PCT), as none of the opposing documents gives a hint to locate one contact surface of the disc with the rim near the end of the flange to accomplish the above task. The rim of D1 has a flange only on the inner side, the outer side flange is formed on the disc, accordingly the cooperation areas between rim and disc are quite different. Claims 2 to 4 depending on claim 1 are showing further embodiments of the invention.

**Industrial applicability:**

The subject-matter of the present application is considered as industrially applicable (Art. 33(4) PCT) as it is used in the vehicle industry.

## "A WHEEL AND A WHEEL DISC"

The present invention relates to a wheel, particularly for use on vehicles, which is made from a stamped material and has a esthetics similar to that of wheels made from light-metal alloys by casting, as well as a disc for use on the aimed wheel.

### Description of the Prior Art

Wheels designed for use on vehicles, particularly automotive vehicles, may be classified into two main categories, according to their manufacture process: wheel made from a stamped material and wheels made from light-metal alloys by casting.

Although the wheels made from a stamped material are easy to manufacture and have a low cost per unit, they have the drawback of not presenting an attractive design, so that their use is limited to low-cost vehicles or commercial utility/commercial vehicles, for which the esthetic factor is not of great importance. The wheels made from light metal are more flexible with regard to working-out and variation in design, thus being esthetically more attractive. However, they are expensive, their price being usually prohibitive for some segments of the automotive market.

The wheels made from a stamped material (usually carbon steel) from the prior art comprise a substantially cylindrical or truncated-cone-shaped rim and a substantially circular wheel disc, rigidly associated to each other, usually by welding, although one often uses screws, rivets, etc. as well. The stamped wheels may be subdivided into two types, according to their constructive form, which are the following.

A first type of stamped wheel is formed by a rim having two opposed end regions, or flanges, which define the region where the diameter of the wheel is maximum. The flanges are protuberant, have a substantially curved "J"-shaped or "J"-shaped profile, and define a groove for fixing a tire. These wheels are called conventional stamped wheels.

A second type of stamped wheel comprises a rim having only one wheel flange, the other flange being an integral part of the wheel disc. Again, the disc flange and rim flange define the region where the wheel di-

ameter is maximum; thus, the disc define the maximum wheel diameter on its flange. These wheels are known as integrated wheels and have the advantage of enabling one to achieve more attractive and elaborate designs, while keeping the manufacture cost low.

5           However, there are some problems associated with the integrated wheels, such as: a greater difficulty in achieving symmetry and alignment of the wheel; a design still inferior to that of the wheels made from light-metal alloys; the need for greater accuracy in the manufacture; a little higher price per unit, etc.

10   Objectives of the Invention

          An objective of the present invention is to provide a stamped wheel, particularly for use on automotive vehicles, which is esthetically as attractive to the consumer as the wheels made from light-metal alloys, more flexible with regard to the options of design than the integrated wheels, and  
15   has the same low manufacture cost of the stamped wheels. The process of welding the wheel disc to the rim may be carried out with existing manufacture equipment, thus demanding little or no investment in purchasing a new equipment for the production line.

          Another objective of the present invention is to provide a wheel  
20   disc for use on the above-described wheel.

Brief Description of the Invention

          The objectives of the present invention are achieved by a wheel, particularly for use on automotive vehicles, formed by associating a substantially cylindrical wheel rim and a substantially circular wheel disc with each  
25   other, the wheel disc comprising at least one through bore, the through bore comprising at least one projection, the projection cooperating with the wheel rim.

          Also, the objectives of the present invention are achieved by a wheel disc, particularly for association with a wheel rim, comprising at least  
30   one through bore that has at least one projection defining a second contact surface for cooperation with the rim.

          The main advantages of the present invention, among other

## CLAIMS

1. A wheel, particularly for use on automotive vehicles, formed by associating a substantially cylindrical wheel rim (2) and a substantially circular wheel disc (3) to each other, the wheel disc (3) comprising at least one through bore (16), the wheel (1) being characterized in that the through bore (16) comprises at least one projection (37), the projection (37) cooperating with the wheel rim (2).
2. A wheel according to claim 1, characterized in that the disc (3) comprises a substantially annular end region that defines a first contact surface (20).
3. A wheel according to claim 2, characterized in that the first contact surface (20) cooperates with the wheel rim (2).
4. A wheel according to claim 3, characterized in that the first contact surface (20) cooperates with the rim (2) at a point substantially close to the flange (4).
5. A wheel according to claim 3, characterized in that the first contact surface (20) cooperates with the rim (2) at the end of the flange (4).
6. A wheel according to claim 4 or 5, characterized in that the first surface (20) is fixed to the rim (2) by welding.
7. A wheel according to claim 1, characterized in that the projection (37) faces the internal surface of the disc (3) and defines a second contact surface (21).
8. A wheel according to claim 1 or 7, characterized in that the projection (37) is substantially annular-segment shaped.
9. A wheel disc, particularly for association to a wheel rim (2), comprising at least one through bore (16) and being characterized in that the through bore (16) comprises at least one projection (37) defining a second contact surface (21) for cooperation with the rim (2).
10. A disc according to claim 9, characterized in that it comprises a substantially annular end region, which defines a first contact surface (20).
11. A disc according to claim 10, characterized in that the first

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ART 34 AMDT

contact surface (20) cooperates with the wheel rim (2).

12. A disc according to claim 9, characterized in that the projection (37) faces its internal surface.

13. A disc according to claim 9 or 12, characterized in that the  
5 projection (37) is substantially annular-segment shaped.



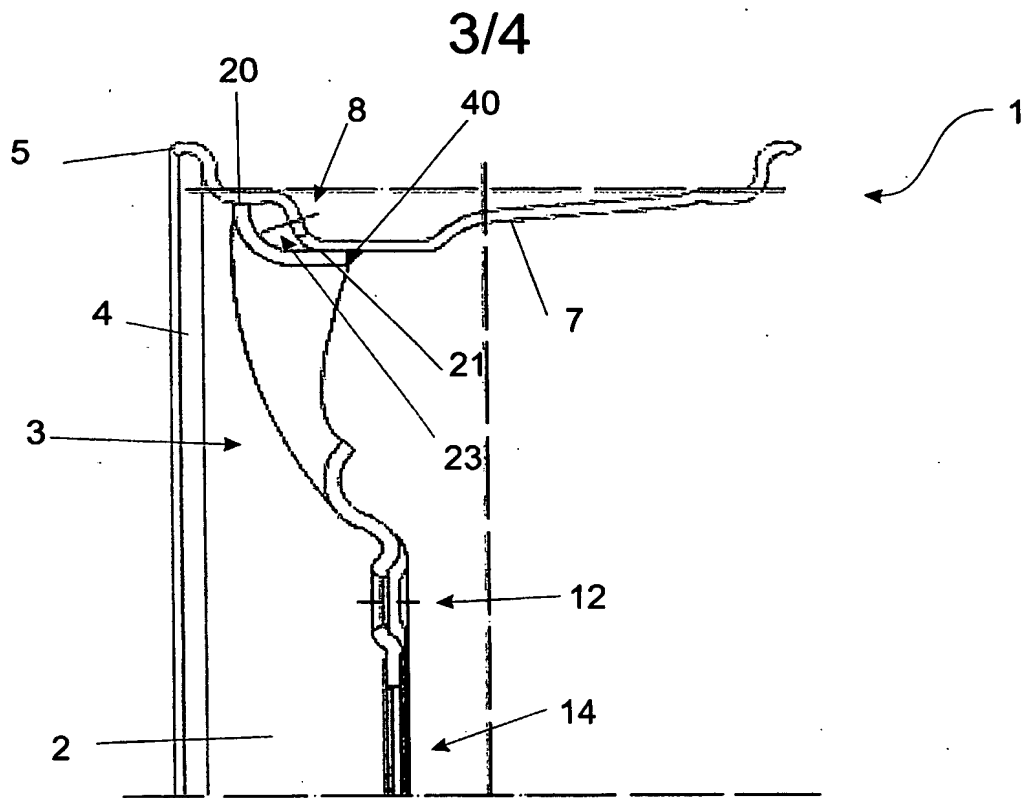


Fig. 5

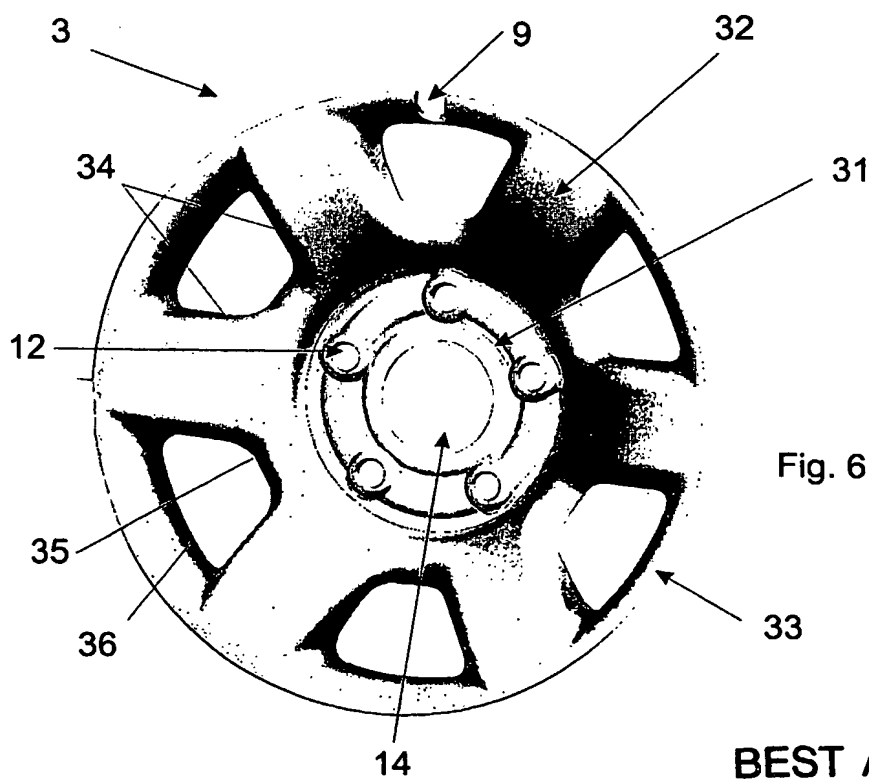


Fig. 6

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APP 34 AMB

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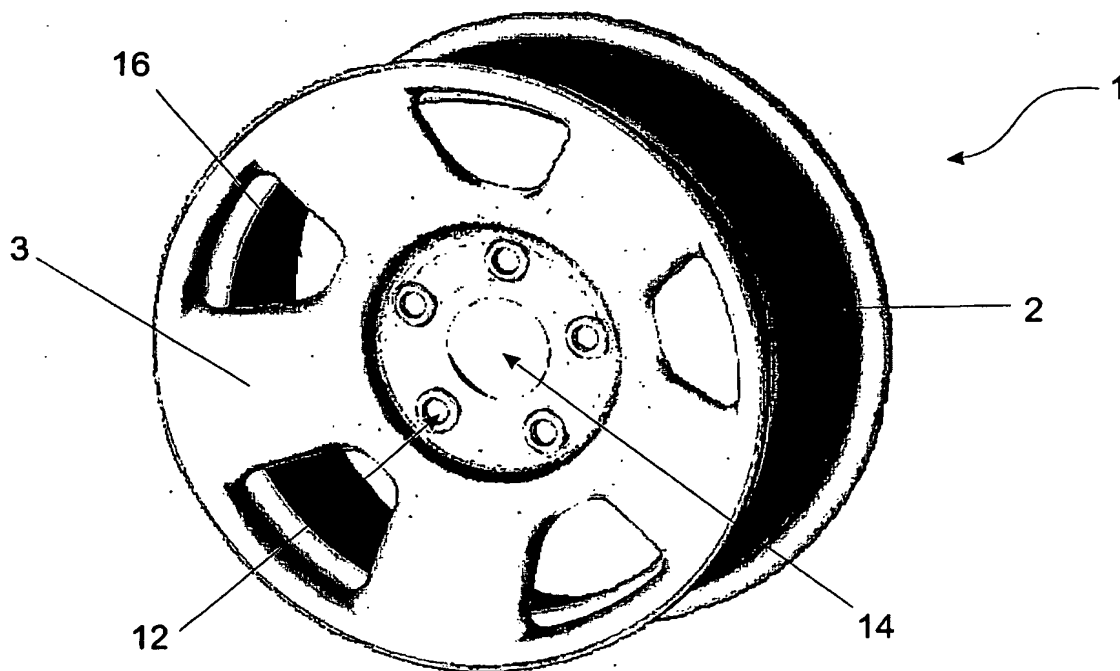


Fig. 7

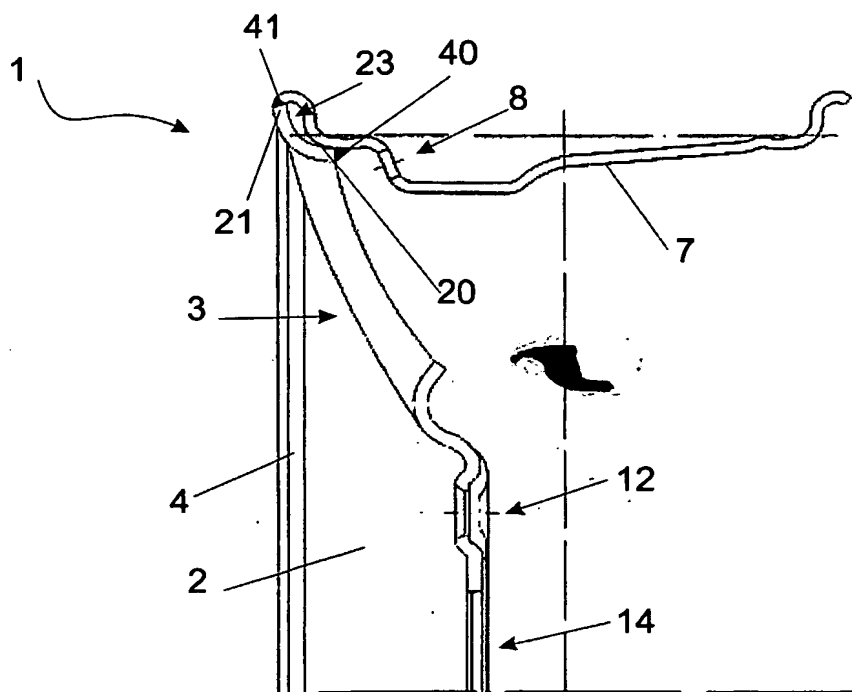


Fig. 8

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/B/03/00127

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B60B3/14 B60B3/16 B60B3/10 B60B3/04 B21D53/26

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60B B21D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 768 191 A (PORSCHE AG) 16 April 1997 (1997-04-16) column 3, line 44 - line 50; figures 2,6,8 ---	1-4,6-13
X	US 6 152 351 A (MAZAC KAREL ET AL) 28 November 2000 (2000-11-28) abstract; figure 1 ---	1-4,6-13
X	US 6 234 581 B1 (STACH JENS) 22 May 2001 (2001-05-22) column 2, line 37 - column 3, line 6; figure 2 ---	1-4,6-13
A	US 6 240 638 B1 (ARCHIBALD KENNETH R ET AL) 5 June 2001 (2001-06-05) abstract; figure 2 -----	1-13

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&amp;\* document member of the same patent family

Date of the actual completion of the international search

21 January 2004

Date of mailing of the international search report

27/01/2004

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# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/EP03/00127

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